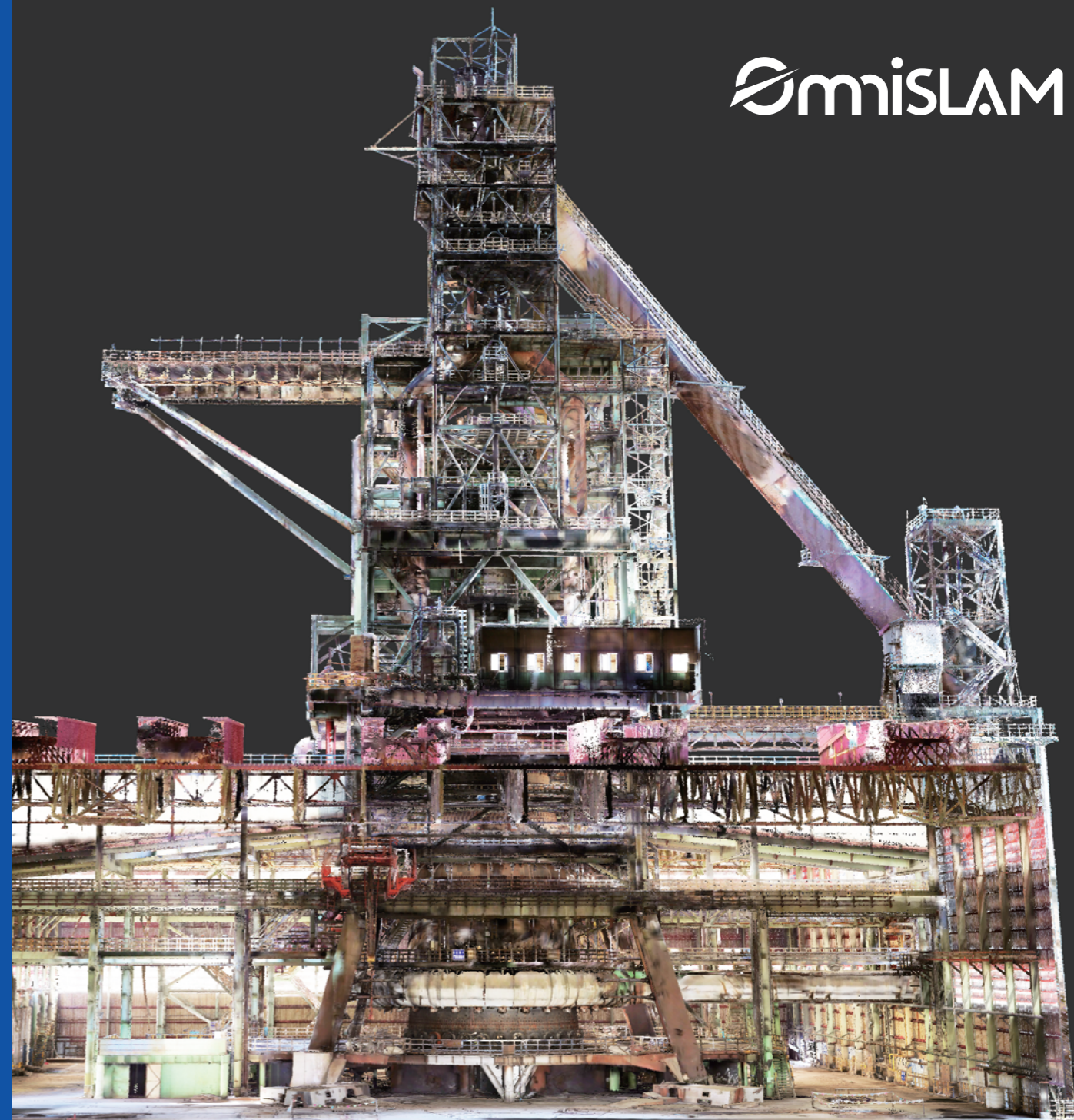


ACCURACY comes FIRST



Mobile SLAM COLOR

3D Laser Scanner

+86 24-2296-1407 support@omni-slam.com www.omni-slam.com

98 Lianshi Lake West Rd., Mentougou Dist., BEIJING, P.R. CHINA



Official Website

*The data on this catalog is reflect typical test conditions. For measurement details, please contact us.

Product Catalog



ABOUT US

Company Introduction

Founded in 2016, OmniSLAM™ has long been dedicated to advancing the research and application of Artificial Intelligence and Robotics Technology in various fields, including surveying and mapping of geospatial information, digital twins, digital factories, intelligent manufacturing, the metaverse, and multimedia, etc. OmniSLAM™ has developed highly accurate mobile color 3D laser scanners with proprietary technologies, including the R8, R8+, D8, T8, RM and RM+ models. OmniSLAM™ commits to exploring the frontiers of science and technology, guided by the vision of "CARVING THE REAL WORLD ACCURATELY", replicating the real world in the digital realm.

- 

July.2016
OmniSLAM Co., Ltd. established.
- 

April.2020
OmniSLAM™ RLP6 achieved the rotating scanning space with single-LiDAR.
- 

June.2022
Surveying and Mapping device R8 launched, which offers absolute accuracy² of WGS84 point clouds within 3cm.
- 

June.2023
Augmented Reality tool D8 launched, entering the realm of color point clouds with HD full space which is Precision Level (mm).
- 

February.2024
Accuracy Modeling equipment R8+ utilizes the rotating single LiDAR to acquire point cloud with Precision Level (mm).
- 

October. 2024
Launch of YHS12 Intrinsically Safe 3D Laser Scanner for Mining Application
- 

November. 2025
Launching the Multi-Carrier T8 for vehicle and backpack use, enabling high-speed, multi-platform surveying with millimeter precision. Introducing 3DGS technology, compatible with R8+, D8 and T8.

2 cm
Repeatability Accuracy⁴

Up to 2 mm
Point Cloud Accuracy

0.005°
Leveling/Vertical Angular Accuracy

4 Algorithms
LIO-PANO⁶, RTK-SLAM⁷, PPK-SLAM⁸, LiRF⁹


PRODUCT

Mobile SLAM Color 3D Laser Scanner

Mobile SLAM Color 3D Laser Scanner is a high-precision data acquisition device powered by four core algorithms: LIO-PANO⁶, RTK-SLAM⁷, PPK-SLAM⁸, and LiRF⁹. Supporting handheld, wearable, and vehicle-mounted modes, it ensures flexible operation and efficient indoor-outdoor data integration, delivering color point clouds with 1:500 precision. It is widely used in 3D modeling, topographic mapping, water conservancy, traffic and completion surveys, mining, facade mapping, underground space modeling, power inspection, forestry, and more.

Mobile TLS - A NEW Species


Mobile TLS can significantly improve efficiency while ensuring high accuracy, **replacing** traditional tripod-based TLS in approximately **80%** of common surveying and point-cloud capture scenarios, particularly for large-area and rapid inspection tasks.





R8 Surveying & Mapping

World-Realistic Color · Precision Level (cm)
Rotating Single LiDAR

MODEL	R8	R8-300
Laser Channels	32	32
Measure Range	120 m	300 m
Points per Second	640,000	640,000

- 

Leveling/Vertical Angular Accuracy
- 

Accuracy Report & GCP Instruction
- 

Full Lifecycle Auto-Calibration



R8+ Accurate Modeling

World-Realistic Color · Precision Level (mm)
Rotating Single LiDAR

MODEL	R8+	R8+300
Laser Channels	32	32
Measure Range	120 m	300 m
Points per Second	640,000	640,000



mm Level Accuracy of Dynamic Scanning



2 mm Point Cloud Thickness



Auto-Modeling of 3D Mesh Models



Pixel-level Texture



T8 Multi-Carrier

World-Realistic Color · Precision Level (mm)
Fixed Triple LiDAR

MODEL	T8	T8-300
Laser Channels	32×3	32×3
Measure Range	120 m	300 m
Points per Second	1,920,000	1,920,000



Auto-Modeling of 3D Mesh Models



Point Cloud Quality of Stationary Scanner



Wearable/Vehicle-on Multi-Carrier



60 km/h Highspeed Scanning



Up to 2mm Accuracy



D8 Augmented Reality

World-Realistic Color · Precision Level (mm)
Fixed Dual LiDAR

MODEL	D8	D8-300
Laser Channels	32×2	32×2
Measure Range	120 m	300 m
Points per Second	1,280,000	1,280,000



Auto-Modeling of 3D Mesh Models



Point Cloud Quality of Stationary Scanner



Up to 2 mm Accuracy



30 km/h Highspeed Scanning



Mobile SLAM Explosion-proof 3D Laser Scanner

OmniSLAM™ offers two Mobile SLAM Explosion-proof 3D Laser Scanners: Mine-used Intrinsic Safety RM (cm) and Mine-used Modeling RM+ (mm). They are applied in coal mines, chemical plants, and other explosion-proof environments to capture point clouds of roadways and shafts. RM+ further enables automatic 3D mesh modeling, supporting digital twin platforms and providing 3D drawings for digital transformation.

RM Mine-used Intrinsic Safety Precision Level (cm) Rotating Single LiDAR

MODEL	RM	RM-300
Laser Channels	32	32
Measure Range	120 m	300 m
Points per Second	640,000	640,000



- IP54 Rating
- 4h Working
- Accuracy Report & GCP Inserting Instruction

RM+ Mine-used Modeling Precision Level (mm) Rotating Single LiDAR

MODEL	RM+	RM+300
Laser Channels	32	32
Measure Range	120 m	300 m
Points per Second	640,000	640,000



- mm Level Accuracy
- Real-time Point Clouds
- Auto-Modeling of 3D Mesh Models



OmniSLAM™ Capturer Data Collection Software

- ⊙ Supports real-time display to avoid repeated scanning.
- ⊙ Display Data, Collection, Storage, and Transmission on phone.
- ⊙ Monitor the device status in real time.

OmniSLAM™ Viewer Data Display Software

- ⊙ Supports interaction display of real scenes and pointclouds.
- ⊙ Supports intelligent 3DGS spatial roaming.
- ⊙ 3D reality-based measurement and precise point cloud clipping.
- ⊙ Ultra-fast loading of massive point clouds, panoramas, and 3DGS datasets.



OmniSLAM™ Mapper Data Solution Software

- ⊙ Automatically process data into point clouds, panoramas, and trajectories.
- ⊙ Supports coordinate transformation, removal of moving objects, and solution of introducing GCP.
- ⊙ Supports point cloud cleaning, WGS84 point clouds generating, and other functions.
- ⊙ Supports exporting of Accuracy Report and GCP Inserting Instruction.

OmniSLAM™ Modeler Automatic Modeling (only for R8+/D8/T8/RM+)

- ⊙ Automatically generate the Mesh Models by using point clouds with precision level (mm).
- ⊙ Supports model files in common formats, such as obj, osgb, and others.
- ⊙ Introduce the third party Model Refinement tools for processing.
- ⊙ No necessary for clusters, a single computer can efficiently build models.
- ⊙ Light-Weighted Modeling Solutions of 3D Real scenes.

3D Laser Scanner Accessories

Battery Kit

Compatible with All Series



Carry-on Convenience



Fast Charging



Intelligent Protection

Portable Backpack

Compatible Products:
R8/R8+



Shockproof Protection



Lightweight Portability



Comfortable Breathability

Extension Rod

Compatible Products:
R8/R8+/RM/RM+



Carbon Fiber Material



4-Meter Rod



Extendable structure

Control Point Extension Rod

Compatible Products:
R8/R8+/RM/RM+



Control-Point Reach



Carbon Fiber Material



Centimeter Accuracy

Vehicle-Mounted Kit

Compatible Products:
R8/R8+



High-Efficiency Operation



Safe Stability



Quick Installation

Wearable Handheld Gimbal

Compatible Products:
R8/R8+/RM/RM+



Handheld Operation



Ergonomic Design



Effort-Saving Convenience

ADVANTAGE

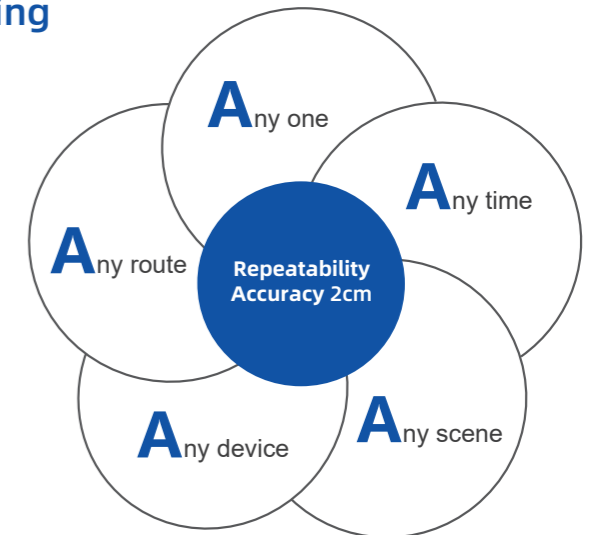
5A-Criterion of Surveying and Mapping

Defination

In the geospatial industry, **Any scene** is scanned by **Anyone** in **Any route** with **Any device** at **Any time**, the UNIQUE point clouds should be acquired theoretically.

Repeatability Accuracy⁴

R8, R8+, D8, T8, RM (Explosion-proof) and RM+ (Explosion-proof) meet the strict 5A criteria for surveying and mapping. The **repeatability accuracy** of the point clouds in WGS84 or local coordinates is within 2 cm by repeatedly scanning.



4 Core Algorithms



OmniSLAM™ RTK-SLAM⁶, a unique Tightly Coupled Complementary Filtering algorithm, delivers point clouds with <2 cm accuracy in WGS84—no GCP required



In weak RTK conditions, misleading GNSS fixes can produce inaccurate point clouds. OmniSLAM™ PPK-SLAM⁷, an innovative Tightly Coupled Complementary Filtering algorithm, maintains accurate fixed solutions, achieving 1:500 WGS84 point cloud accuracy even in challenging environments.



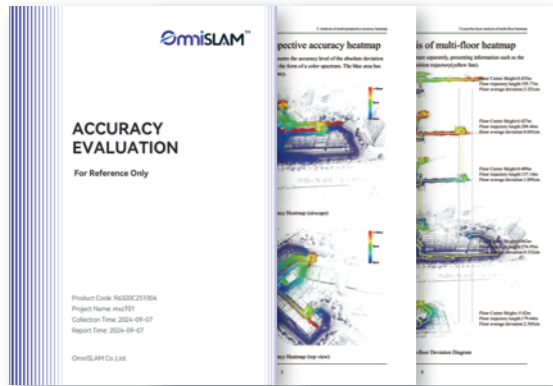
Online colorization technology with multi-model fusion of lidar and panoramic camera.



To obtain a color point cloud with denser data, thinner thickness, clearer color assignment and clearer depiction, so that the point cloud has the effect of image version.

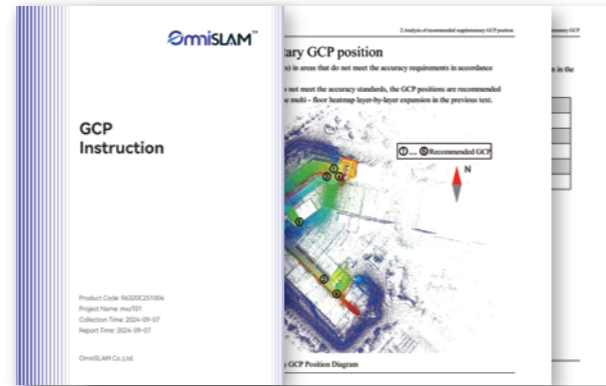
Accuracy Evaluation

OmniSLAM™ Mapper generates an Accuracy Evaluation*, providing the Mean Value of Absolute Deviation (MVAD) and a 3D thermal map of point cloud accuracy for each scan.



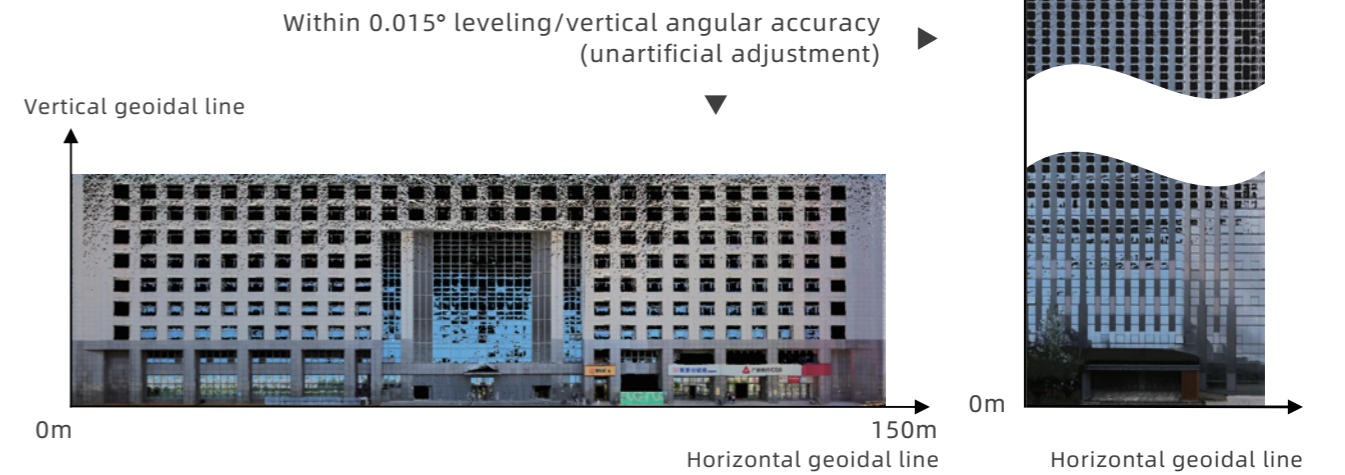
GCP Instruction

The Mobile SLAM 3D Laser Scanner generates GCP Instructions*. When scan accuracy is unsatisfactory, it recommends the required number and positions of GCPs.



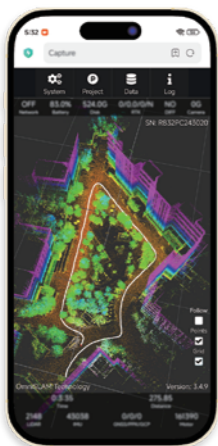
“Horizontal & Vertical” of Point Clouds

The Mobile SLAM 3D Laser Scanner generates absolute WGS84 point clouds with leveling/vertical angular accuracy within 0.015° (0.005° for R8+/D8/T8/RM+), ensuring WGS84 accuracy within 2cm for both ground and high-altitude measurements.



Real-time Point Clouds

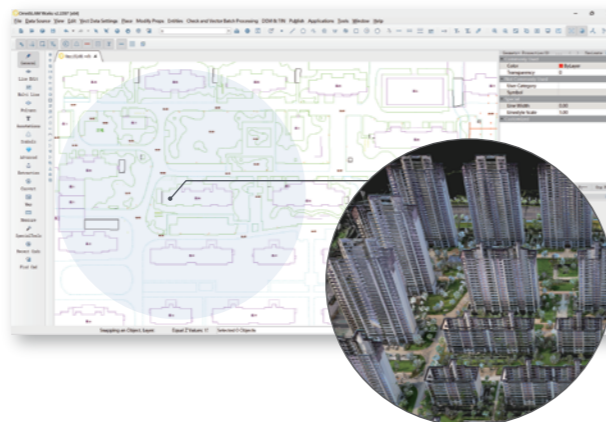
The OmniSLAM™ Capturer generates and displays point clouds in real time, enabling operators to scan sites thoroughly without omissions, repetitions, or rework. Preliminary results are produced simultaneously, making each scan fast and high-quality.



Real-time Display of Point Clouds

1:500 Accuracy of Surveying and Mapping

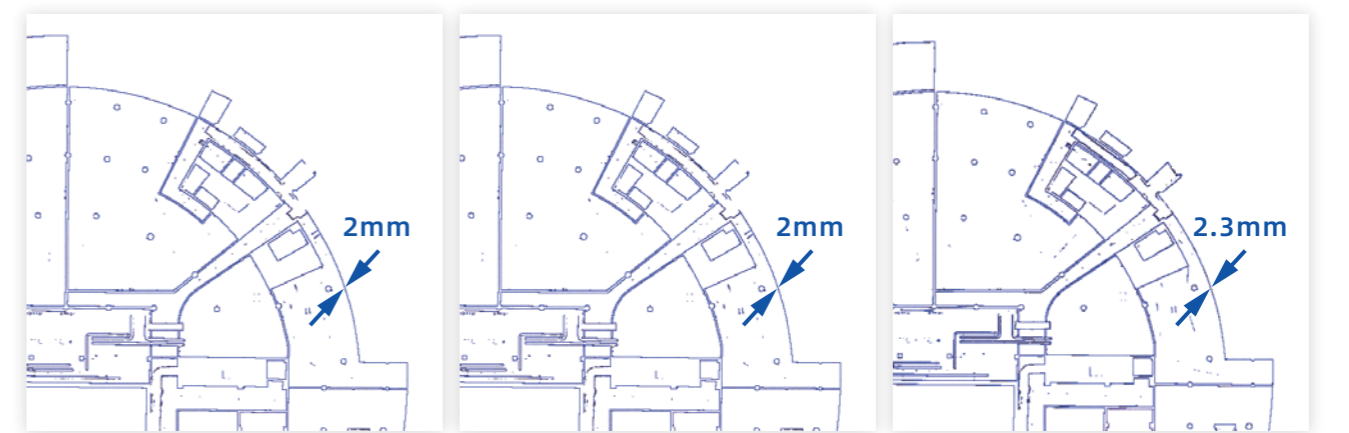
The OmniSLAM™ Mobile SLAM 3D Laser Scanner delivers relative point cloud accuracy within mm and absolute accuracy within 2cm, meeting 1:500 surveying and mapping requirements and the needs of various industries.



DLG (1:500) of Color Point Clouds

Full Lifecycle Auto-Calibration

Self-Adaptive Online Calibration (SAOC²) provides full lifecycle auto-calibration, keeping point cloud accuracy stable without deterioration. No factory calibration is required, improving efficiency and reducing maintenance costs.



The Point Cloud Thickness in the 1st Year* The Point Cloud Thickness in the 2nd Year* The Point Cloud Thickness in the 3rd Year*

*For product compatibility, please refer to the product specification comparison table.

*The above data is based on internal testing results; actual performance may vary under different conditions.

Light-Weighted Auto Modeling of 3D Real Scenes

Precision Level (mm) point clouds support 3D mesh generation in OBJ/OSGB format. With OmniSLAM™'s multi-model fusion of LiDAR and panoramic images, heavy computing is not required—a single computer can efficiently build mesh models. The output is also compatible with third-party model refinement software.



Colored Point Clouds with Precision Level (mm)



Mesh Modeling

3D Gaussian Splatting

Powered by advanced 3DGS technology, complex point cloud and image data are transformed into high-precision, ultra-realistic, and fully interactive 3D models—making survey results not only accurate and reliable but also intuitive and easy to use across diverse applications.



3DGS Visualization of Table Tennis Hall



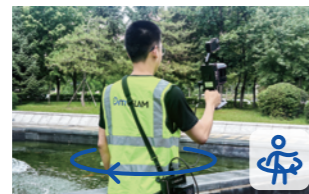
3DGS Visualization of Factory

Agile Movements

With OmniSLAM™'s advanced SLAM algorithm, operators don't need slow or careful handling—the scanner captures highly accurate point clouds even with agile movements.



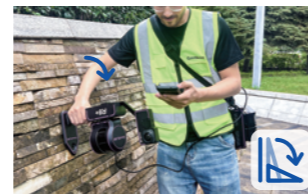
Running



Rotating



Swing



Inverting

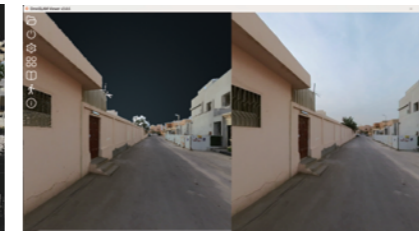
APPLICATION

Large-scale DLG Drawing

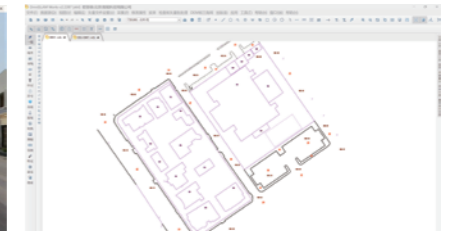
The Mobile SLAM Color Laser Scanner acquires the no-fly zone DLG efficiently and uses the Panoramic Image to do Real Time Interpretation which can complete the large-scale drawing works.



Colored Point Clouds of Buildings



Point Clouds & Panoramic Picture



Digital Line Graphic

Mine Roadway Cubage Calculation

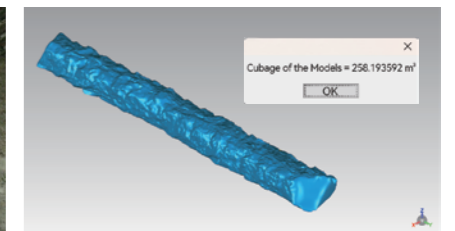
The Point Clouds that is acquired from the Mobile SLAM Color Laser Scanner clearly displays the form and structure of the mine roadway, it also can be used for quick calculation of the cubage, which improves the management efficiency of mines.



Mine Roadway Point Clouds



Mine Roadway colored Point Clouds



Cubage Calculation of Point Clouds

Factory Digital Twin

OmniSLAM™ Modeler processes precision-level (mm) colored point clouds into 3D Mesh Models in OBJ/OSGB format to provide basic data for the factory digital twin.



Waste Heat Station Colored Point Clouds



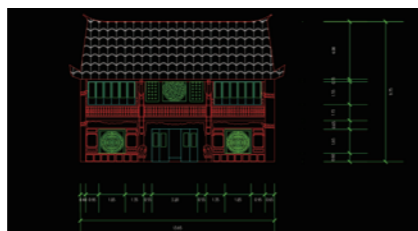
Waste Heat Station 3D Mesh Models

Digital Cultural Relics

The Mobile SLAM Color 3D Laser Scanner is able to efficiently acquire precision level (mm) point clouds of the interior furnishings, exterior carvings, and ancient building structures. The scanner quickly plots flat/elevation/sectional drawings, and uses the OmniSLAM™ Modeler software to get 3D Mesh Models, which can efficiently assist the digital protection of ancient buildings.



Colored Point Clouds of Ancient Buildings

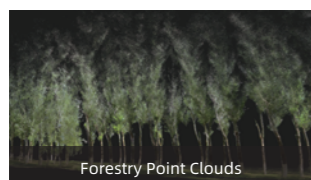


Facade Line Graphic

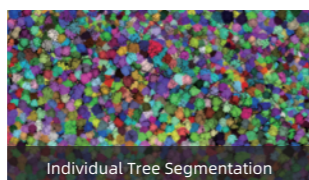


3D Mesh Models of Ancient Buildings

Forestry Survey

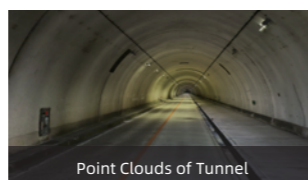


Forestry Point Clouds

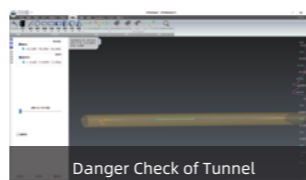


Individual Tree Segmentation

Tunnel Maintenance



Point Clouds of Tunnel



Danger Check of Tunnel

3D Mesh Models of Petrochemical Base

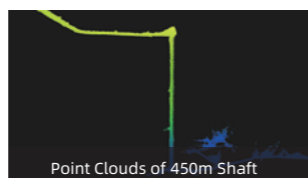


Point Clouds of Factory Facilities

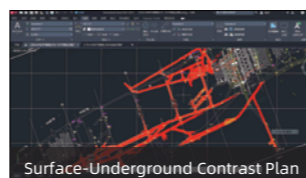


3D Mesh Models of Factory Facilities

Analysis of Mine Spatial Data



Point Clouds of 450m Shaft



Surface-Underground Contrast Plan

Power Station Inspection

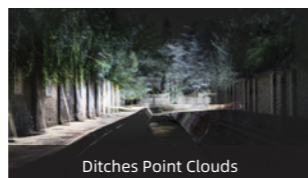


Point Clouds of Exchange Power Station

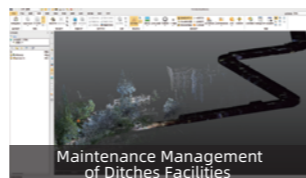


Routes Plan of the UAV

Protection of Water Conservancy Project



Ditches Point Clouds

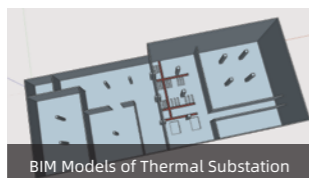


Maintenance Management of Ditches Facilities

BIM Construction Management



Point Clouds of Airport Thermal Substation

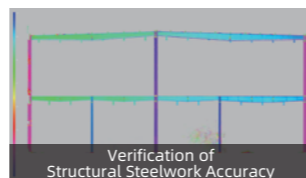


BIM Models of Thermal Substation

Factory Construction Monitoring



Point Clouds of Structural Steelwork



Verification of Structural Steelwork Accuracy

PARAMETER



RM



RM+

Relative Accuracy ¹	1 cm	mm Level
Absolute Accuracy ²	3 cm	3 cm
5A Criteria of Surveying & Mapping ³	√	√
Repeatability Accuracy ⁴	2 cm	2 cm
Leveling/Vertical Angular Accuracy	0.015°	0.005°
Point Cloud Density	10,000 pts/m ²	250,000 pts/m ²
Point Cloud Thickness	1 cm	2 mm
3D Thermal Map of Point Cloud Accuracy	√	√
Accuracy Report	√	√
GCP Instruction	√	√
Real-time Point Clouds	√	√
3D Mesh Models	×	√
IP Rating	IP54	IP54
Accuracy Guarantee	Full Lifecycle Auto-Calibration	Full Lifecycle Auto-Calibration



R8



R8+



D8



T8

Relative Accuracy¹	1 cm	mm Level (Dynamic/Static Scanning)	2 mm (Dynamic/Static Scanning)	2 mm (Dynamic/Static Scanning)
Absolute Accuracy²	Horizontal: 1.8 cm Vertical: 2.5 cm	Horizontal: 1.8 cm Vertical: 2.5 cm	Horizontal: 1.8 cm Vertical: 2.5 cm	Horizontal: 1.8 cm Vertical: 2.5 cm
5A Criteria of Surveying and Mapping³	√	√	√	√
Repeatability Accuracy⁴	2 cm	2 cm	2 cm	2 cm
Leveling/Vertical Angular Accuracy	0.015°	0.005°	0.005°	0.005°
Point Cloud Density	10,000 pts/m ²	250,000 pts/m ²	250,000 pts/m ²	250,000 pts/m ²
Point Cloud Thickness	1 cm	2 mm	2 mm	2 mm
Moving Objects Removal	√	√	√	√
Accuracy Guarantee	Full Lifecycle Auto-Calibration	Full Lifecycle Auto-Calibration	Full Lifecycle Auto-Calibration	Full Lifecycle Auto-Calibration
LiDAR	32·120 m·640,000 pts/s 32·300 m·640,000 pts/s	32·120 m·640,000 pts/s 32·300 m·640,000 pts/s	32·120 m·1,280,000 pts/s 32·300 m·1,280,000 pts/s	32·120 m·1,920,000 pts/s 32·300 m·1,920,000 pts/s
Satellite System	GPS/GLONASS/Galileo/BDS/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/GLONASS/Galileo/BDS/QZSS
RTK Accuracy	Horizontal: 0.8 cm+1 ppm Vertical: 1.5 cm+1 ppm	Horizontal: 0.8 cm+1 ppm Vertical: 1.5 cm+1 ppm	Horizontal: 0.8 cm+1 ppm Vertical: 1.5 cm+1 ppm	Horizontal: 0.8 cm+1 ppm Vertical: 1.5 cm+1 ppm
CORS System	√	√	√	√
GNSS Receiver	√	√	√	√

R8**R8+****D8****T8**

	R8	R8+	D8	T8
Image Sensor	1 inch SONY CMOSx2	1 inch SONY CMOSx2	1 inch SONY CMOSx4	1 inch SONY CMOSx2
Camera Field of View	360°	360°	360°	360°
Lens	Leica F2.2x2	Leica F2.2x2	Leica F2.2x4	Leica F2.2x2
Working Temp.	-25°C~65°C	-25°C~65°C	-25°C~65°C	-25°C~65°C
Size (L*W*H)	35.0x32.0x99.0 cm	35.0x32.0x99.0 cm	45.8x31.6x104.7 cm	46.6x30.5x47.2 cm
Weight	Wear: 8.7 kg Hand: 2.1 kg (120 m) Hand: 1.8 kg (300 m)	Wear: 8.7 kg Hand: 2.1 kg (120 m) Hand: 1.8 kg (300 m)	Wear: 10.0 kg Hand: 4.3 kg	11.5 kg
Real-time Point Clouds	√	√	√	√
SAOC⁵	√	√	√	√
LIO-PANO⁶	√	√	√	√
RTK-SLAM⁷	√	√	√	√
PPK-SLAM⁸	√	√	√	√
LiRF⁹	×	√	√	√
3D Mesh Models	×	√	√	√
3DGS	×	√	√	√
3D Thermal Map of Point Cloud Accuracy	√	√	√	√
Accuracy Report	√	√	√	√
GCP Instruction	√	√	√	√

- 1. Relative Accuracy:** Deviation of relative positions between points within a point cloud compared to their true values; independent of external coordinate systems.
- 2. Absolute Accuracy:** Deviation between point cloud coordinates and true coordinates in an external coordinate system; dependent on external coordinate system.
- 3. 5A Criterion of Surveying and Mapping:** In the geospatial information, anyone, at any time, using any device, following any route, and scanning any scene, can obtain the unique result of point clouds.
- 4. Repeatability Accuracy:** Difference between two independent scans of the same scene; with GCP or RTK, relative deviation ≤ 2 cm.

- 5. SAOC:** Self-Adaptive Online Calibration, precision stays intact for years, no return maintenance required.
- 6. LIO-PANO:** Multi-Modal Fusion of LiDAR and Panoramic Camera for Point Cloud Colorization.
- 7. RTK-SLAM:** A tightly coupled complementary filtering technique integrating RTK (Real-Time Kinematic) and SLAM for fast, high-accuracy mapping.
- 8. PPK-SLAM:** A tightly coupled complementary filtering technique integrating PPK (Post-Processed Kinematic) and SLAM for robust, high-accuracy mapping.
- 9. LiRF:** A LiDAR Radiance Field technology enabling denser point clouds and more realistic representation of complex details.